CLAIMS

What is claimed is:

1.   1.   A method for alerting animals to prevent animal-vehicle crashes, comprising:
2.   projecting from a moving vehicle a sound pattern comprising a plurality of randomly
3.   selected different groups of audible sounds separated by first silent periods between
4.   the groups of sounds, wherein each group of sounds includes one or more sounds in
5.   an audible frequency range.

1.   2.   The method of Claim 1 wherein a ratio of a duration of the groups of sounds to
2.   a ratio of a duration of the first silent periods is less than 1:1.

1.   3.   The method of Claim 1 wherein at least one of the plurality of different groups
2.   of audible sounds includes a plurality of sounds at different audible frequencies.

1.   4.   The method of Claim 3 wherein at least one of the plurality of different groups
2.   of audible sounds includes a plurality of sounds at different audible frequencies
3.   separated by second silent periods between the sounds within the group of sounds,
4.   said second silent periods having a duration similar to the duration of the sounds
5.   included in the group of sounds.

1.   5.   The method of Claim 4 wherein a duration of the first silent periods is longer
2.   than a duration of the second silent periods.

1.   6.   The method of Claim 1 wherein the groups of sounds include sounds in the
2.   audible frequency range of 1 kHz to 10 kHz.

1.   7.   The method of Claim 6 wherein the groups of sounds include sounds in the
2.   audible frequency range of 1 kHz to5 kHz.

1.   8.   The method of Claim 1 comprising additionally determining a speed of the
2.   moving vehicle and adjusting a volume of the sound pattern projected from the
3.   moving vehicle based on the determined speed of the moving vehicle.

1.   9.   The method of Claim 8 comprising automatically initiating the projection of
2.   the sound pattern from the moving vehicle when the determined speed of the moving
3.   vehicle exceeds a selected threshold speed and automatically terminating the

4   projection of the sound pattern from the moving vehicle when the determined speed

5   of the moving vehicle is less than the selected threshold speed.

1   10.   The method of Claim 8 wherein determining a speed of the moving vehicle

2   includes determining a speed of the moving vehicle from an on-board vehicle

3   computer.

1   11.   The method of Claim 1 comprising additionally determining a location of the

2   moving vehicle and automatically adjusting the sound pattern projected from the

3   moving vehicle in response to the determined location of the moving vehicle.

1   12.   The method of Claim 11 wherein determining a location of the moving vehicle

2   includes determining a location of the moving vehicle using a global positioning

3   system.

1   13.   An animal alerting device adapted for mounting on a vehicle to prevent

2   animal-vehicle crashes, comprising:

3   a speaker;

4   a driver circuit coupled to the speaker for driving the speaker in response to

5   sound generation control signals received thereby; and

6   a control circuit coupled to the driver circuit and adapted to generate the sound

7   generation control signals for producing via the driver circuit and speaker a sound

8   pattern comprising a plurality of randomly selected different groups of audible sounds

9   separated by first silent periods between the groups of sounds, wherein each group of

10   sounds includes one or more sounds in an audible frequency range.

1   14.   The animal alerting device of Claim 13 wherein the control circuit includes a

2   microprocessor and memory, wherein the memory includes data defining a plurality

3   of different groups of audible sounds, and wherein the microprocessor is programmed

4   to select randomly from among the data defining the plurality of different groups of

5   audible sounds to generate the sound generation control signals.

1   15.   The animal alerting device of Claim 13 wherein a ratio of a duration of the

2   groups of sounds to a duration of the first silent periods is less than 1:1.

1　16.　The animal alerting device of Claim 14 wherein the data defining a plurality of
2　different groups of audible sounds defines at least one of the plurality of different
3　groups of sounds including a plurality of sounds at different audible frequencies.

1　17.　The animal alerting device of Claim 16 wherein the data defining at least one
2　of the plurality of different groups of audible sounds includes data defining at least
3　one of the plurality of different groups of sounds including a plurality of sounds at
4　different audible frequencies separated by second silent periods between the sounds
5　within the group of sounds, said second silent periods having a duration similar to a
6　duration of the sounds included in the group of sounds.

1　18.　The animal alerting device of Claim 17 wherein a duration of the first silent
2　periods is longer than a duration of the second silent periods.

1　19.　The animal alerting device of Claim 13 wherein the groups of sounds include
2　sounds in the audible frequency range of 1 kHz to 10 kHz.

1　20.　The animal alerting device of Claim 19 wherein the groups of sounds include
2　sounds in the audible frequency range of 1 kHz to5 kHz.

1　21.　The animal alerting device of Claim 13 wherein the control circuit is adapted
2　to determine a speed of the vehicle and to adjust a volume of the sound pattern
3　produced from the speaker based on the determined speed of the vehicle.

1　22.　The animal alerting device of Claim 21 wherein the control circuit is adapted
2　automatically to initiate the production of the sound pattern from the speaker when
3　the determined speed of the vehicle exceeds a selected threshold speed and
4　automatically to terminate the production of the sound pattern from the speaker when
5　the determined speed of the vehicle is less than the selected threshold speed.

1　23.　The animal alerting device of Claim 21 wherein the control circuit is coupled
2　to an on-board vehicle computer to determine a speed of the vehicle.

1　24.　The animal alerting device of Claim 23 wherein the control circuit is coupled
2　to an on-board vehicle computer via an OBD-II port connection.

1   25.   The animal alerting device of Claim 13 wherein the control circuit is adapted

2   to determine a location of the moving vehicle and automatically to adjust the sound

3   pattern produced from the speaker in response to the determined location of the

4   vehicle.

1   26.   The animal alerting device of Claim 25 wherein the control circuit is coupled

2   to a global positioning system receiver to determine a location of the moving vehicle.

1   27   The animal alerting device of Claim 13 wherein the speaker is a piezo-electric

2   speaker.

1   28.   A method for alerting animals to prevent animal-vehicle crashes, comprising:

2   projecting from a moving vehicle a sound pattern comprising groups of sounds

3   separated by silent periods, wherein each group of sounds includes one or more

4   sounds in an audible frequency range, and wherein a ratio of a duration of the groups

5   of sounds to a duration of the silent periods in the sound pattern is less than 1:1.

1   29.   The method of Claim 28 wherein the groups of sounds included in the sound

2   pattern include a plurality of different groups of sounds.

1   30.   The method of Claim 29 comprising additionally including the groups of

2   sounds in the sound pattern in a random sequence.

1   31.   The method of Claim 28 wherein at least one of the plurality of different

2   groups of sounds includes a plurality of sounds at different frequencies.

1   32.   The method of Claim 31 wherein at least one of the plurality of different

2   groups of sounds includes a plurality of sounds at different frequencies separated by

3   second silent periods between the sounds within the group of sounds, said second

4   silent periods having a duration similar to a duration of the sounds included in the

5   group of sounds.

1   33.   The method of Claim 28 wherein the groups of sounds include sounds in the

2   audible frequency range of 1 kHz to 10 kHz.

1   34.   The method of Claim 33 wherein the groups of sounds include sounds in the

2   audible frequency range of 1 kHz to5 kHz.

1   35.   An animal alerting device adapted for mounting on a vehicle to prevent
2   animal-vehicle crashes, comprising:
3   a speaker;
4   a driver circuit coupled to the speaker for driving the speaker in response to
5   sound generation control signals received thereby; and
6   a control circuit coupled to the driver circuit and adapted to generate the sound
7   generation control signals for producing via the driver circuit and speaker a sound
8   pattern comprising groups of sounds separated by silent periods, wherein each group
9   of sounds includes one or more sounds in an audible frequency range, and wherein a
10   ratio of a duration of the groups of sounds to a duration of the silent periods in the
11   sound pattern is less than 1:1.

1   36.   The animal alerting device of Claim 35 wherein the control circuit includes a
2   microprocessor and memory, wherein the memory includes data defining a plurality
3   of different groups of sounds, and wherein the microprocessor is programmed to
4   select randomly from among the data defining the plurality of different groups of
5   sounds to generated the sound generation control signals.

1   37.   The animal alerting device of Claim 36 wherein the data defining a plurality of
2   different groups of sounds defines at least one of the plurality of different groups of
3   sounds including a plurality of sounds at different frequencies.

1   38.   The animal alerting device of Claim 37 wherein the data defining at least one
2   of the plurality of different groups of sounds includes data defining at least one of the
3   plurality of different groups of sounds including a plurality of sounds at different
4   frequencies separated by second silent periods between the sounds within the group of
5   sounds, said second silent periods having a duration similar to the duration of the
6   sounds included in the group of sounds.

1   39.   The animal alerting device of Claim 35 wherein the groups of sounds include
2   sounds in the audible frequency range of 1 kHz to 10 kHz.

1   40.   The animal alerting device of Claim 39 wherein the groups of sounds include
2   sounds in the audible frequency range of 1 kHz to5 kHz.

1   41.   The animal alerting device of Claim 35 wherein the speaker is a piezoelectric

2   speaker.

1   42.   A method for alerting animals to prevent animal-vehicle crashes, comprising:

2   (a)   projecting from a moving vehicle a sound pattern;

3   (b)   determining a location of the moving vehicle; and

4   (c)   adjusting automatically the sound pattern projected from the moving

5   vehicle in response to the determined location of the moving vehicle.

1   43.   The method of Claim 42 wherein the sound pattern comprises a plurality of

2   randomly selected different groups of audible sounds separated by silent periods

3   between the groups of sounds, wherein each group of sounds includes one or more

4   sounds in an audible frequency range.

1   44.   The method of Claim 42 wherein determining a location of the moving vehicle

2   includes determining a location of the moving vehicle using a global positioning

3   system receiver.

1   45.   An animal alerting device adapted for mounting on a vehicle to prevent

2   animal-vehicle crashes, comprising

3   (a)   a speaker;

4   (b)   a driver circuit coupled to the speaker for driving the speaker in

5   response to sound generation control signals;

6   (c)   location determining means for determining a location of the vehicle;

7   and

8   (d)   a control circuit coupled to the driver circuit and to the location

9   determining means and adapted to generate the sound generation control signals for

10   producing via the driver circuit and speaker a sound pattern and to adjust

11   automatically the sound pattern produced from the speaker in response to the

12   determined location of the vehicle.

1   46.   The animal alerting device of Claim 45 wherein the location determining

2   means includes a global positioning system receiver.

1   47.   The animal alerting device of Claim 45 wherein the speaker is a piezo-electric

2   speaker.

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